

## **Chapter VII**

# **Defining Personalized Learning Views of Relevant Learning Objects in a Collaborative Bookmark Management System**

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## **Abstract**

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*In this chapter, we introduce how to use a Web-based hybrid recommender system developed with a collaborative bookmark management system approach. The system combines content analysis and the development of virtual clusters of students and educational sources. It provides facilitation in the use of a huge amount of digital information stored in a distributed learning environment on the basis of the student's personal requirements and interests. By adopting a hybrid approach, the system is able to effectively filter relevant resources from a wide heterogeneous environment like the Web, taking advantage of the common interests of the users and also maintaining the*

*benefits provided by content analysis. The basic idea is to appropriately help students classifying domain-specific information found on the Web and saved as bookmarks, to recommend these documents to other students with similar interests, and to notify users periodically about new, potentially interesting documents. Documents are represented using metadata model.*

## Introduction

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In a distributed learning environment, there is likely to be large number of educational resources (Web pages, lectures, journal papers, learning objects, etc.) stored in many distributed and differing repositories on the Internet. Without guidance, students would probably have great difficulties in finding the reading material relevant to a particular learning task. The meta-data descriptions about learning object representation provide information about properties of the learning objects. However, the meta-data by itself may not provide qualitative information about different objects nor may it provide information for customized views. This problem is becoming particularly important in Web-based education, where the variety of learners taking the same course is much greater.

Conversely, the courses produced using adaptive hypermedia or intelligent tutoring system technologies are able to dynamically select the most relevant learning material from their knowledge bases for each individual student. Nevertheless, generally, these systems can't directly benefit from existing repositories of learning material (Brusilovsky & Nijhavan, 2002). This chapter provides a contribution to this issue. The basic idea is to appropriately gather different agent-based modules that would help students classify domain-specific information found on the Web and saved as bookmarks, to recommend these documents to other students with similar interests, and to notify the students periodically about new, potentially interesting documents. The system is developed to provide immediate portability and visibility from different user locations, enabling access to a personal bookmark repository just by using a Web browser.

Recently, learning objects (LOs) have been the center of attention in e-learning mechanisms and have been designated as atomic units of knowledge (Wetterling & Collis, 2003). In educational settings, learning objects can be of different kinds, for example, from files having static content (like HTML, PDF, or PowerPoint presentation format) to sophisticated interactive formats (like HTML pages loaded with JavaScript or Java applet, etc). Audio files, video clips, or Flash animations also constitute learning objects. An LO comprises a chunk of content material, which can be re-used or shared in different learning situations. LO standards allow the use or re-use of content from one system to another so that these can be adopted across different computer platforms and learning systems. The IEEE Standard for Learning Object Metadata (LOM) ([http://grouper.ieee.org/p1484/wg12/files/LOM\\_1484\\_12\\_1\\_v1\\_Final\\_Draft.pdf](http://grouper.ieee.org/p1484/wg12/files/LOM_1484_12_1_v1_Final_Draft.pdf)) is the first accredited standard for learning object technology (<http://ltsc.ieee.org>).

There are presently countless LOs available for commercial and academic use. CAREO (<http://www.careo.org>) and MERLOT (<http://www.merlot.org/Home.po>) are two global

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